

CLAIMS

What is Claimed is:

1. (Withdrawn) A layered group III-N article, comprising:
a silicon single crystal substrate;
a single crystal zinc oxide (ZnO) buffer layer disposed on and in contact with said substrate, and
a single crystal group III-N layer disposed on said ZnO buffer layer.
2. (Withdrawn) The article of claim 1, wherein said group III-N layer comprises GaN.
3. (Withdrawn) The article of claim 1, wherein said group III-N layer is an epitaxial layer.
4. (Withdrawn) The article of claim 1, wherein a thickness of said ZnO layer is less than 200 angstroms.
5. (Withdrawn) The article of claim 5, wherein said thickness is less than 100 angstroms.
6. (Withdrawn) A light-emitting diode (LED), comprising:
a silicon (111) single crystal substrate;
a zinc oxide (ZnO) comprising layer on said substrate;
a single crystal group III-nitride semiconductor epitaxial layer on said ZnO layer,
and

an active layer on said group III-nitride layer.

7. (Withdrawn) The LED of claim 6, wherein said ZnO layer is a single crystal.
8. (Withdrawn) The LED of claim 6, wherein said group III-nitride layer comprises GaN.
9. (Withdrawn) The LED of claim 6, wherein one terminal of said LED is contacted through said silicon substrate.
10. (Withdrawn) The LED of claim 6, further comprising a first and second cladding layer sandwiching said active layer.
11. (Withdrawn) The LED of claim 6, wherein said active layer comprises $\text{In}_x\text{Ga}_{1-x}\text{N}$, wherein $0 \leq x \leq 1$.
12. (Original) A method for forming group III-N based articles, comprising the steps of:
providing a single crystal silicon substrate;
depositing a single crystal zinc oxide (ZnO) layer on said substrate, and
depositing a single crystal group III-N layer on said ZnO layer, wherein at least a portion of said step of depositing group III-N layer is performed at a temperature of less than 600° C.
13. (Original) The method of claim 12, wherein said step of depositing said group III-N layer comprises depositing a seed layer at a temperature of no more than 600° C, followed by a

step of depositing another portion of said group III-N layer at a temperature of more than 600° C.

14. (Original) The method of claim 12, further comprising the step of treating said ZnO layer with a gallium comprising gas before said step of depositing said group III-N layer.

15. (Original) The method of claim 14, wherein said gallium comprising gas comprises triethyl gallium.

16. (Original) The method of claim 12, wherein said group III-N layer comprises GaN.

17. (Original) The method of claim 12, wherein said group III-N layer is an epitaxial layer.

18. (Original) The method of claim 12, wherein a thickness of said ZnO layer is less than 200 angstroms.

19. (Original) The method of claim 12, wherein said step of depositing a zinc oxide (ZnO) layer comprises pulsed laser deposition.